

US EPA ARCHIVE DOCUMENT

EEE BRANCH REVIEW

DATE: IN 1/3/78 OUT 6/3/78 IN _____ OUT _____ IN _____ OUT _____
FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 239-1721 and 239-1281

PETITION OR EXP. PERMIT NO. _____

DATE DIV. RECEIVED 12/20/77

DATE OF SUBMISSION _____

DATE SUBMISSION ACCEPTED _____

TYPE PRODUCTS(S): I, D, H, F, N, R, S _____

DATA ACCESSION NO(S). 232595, 232596

PRODUCT MGR. NO. 16 F. Gee

PRODUCT NAME(S) Dibrom

COMPANY NAME Chevron Chemical

SUBMISSION PURPOSE Data submission

CHEMICAL & FORMULATION Naled 1,2-dibromo-2,2-dichloroethyl dimethyl phosphate

100.0 Pesticidal Use

Dibrom is an insecticide registered for a variety of crops and insects in its various formulations. The current submission is for a data review of avian dietary studies and a field study on effects to non-target organisms.

101.0 Chemical and Physical properties

101.1 Chemical name

1,2-dibromo-2,2-dichloroethyl dimethyl phosphate.

101.2 Common name

Naled, Dibrom

103.0 Toxicological properties

(See attached validation sheets)

103.2 Subacute toxicity

Mallard duck 8-day dietary LC50 (tech) = 2724
ppm (core)

Bobwhite quail 8-day dietary LC50 (tech) = 2117
ppm (core)

Ring-necked pheasant 8-day dietary LC50 (tech)
= 2538 ppm (core)

Japanese quail 8-day dietary LC50 (tech) =
1327 ppm (supplemental)

103.5 Field toxicity

Impact on several mollusks, crustaceans, and fish in salt marshes was negligible when Dibrom 14 was applied as a mosquitocide (supplemental study, except invalid for mallard duck, blue crab, and grass shrimp).

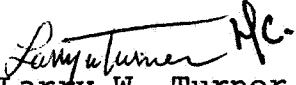
107.0 Conclusions

107.4 Data adequacy

The referenced avian dietary studies were considered acceptable to support registration, except for the Japanese quail. The study on the impact of Dibrom 14 on non-target salt marsh organisms was considered to have some value in determining the hazard to non-target organisms for use as a mosquitocide in salt marsh ecosystems only.

107.7 Recommendations

The voluntarily submitted fish and wildlife studies have been reviewed by the Environmental Safety Section and have been added to our files on Dibrom/Naled.


Larry W. Turner
Environmental Safety Section
June 3, 1978

TESTING:

Q.1. S

CHEMICAL NAME

Technical

Naled
(Dibrom)

Larry Turner

June 2, 1978

Avian dietary LC50
Bobwhite quail, Ring-necked
pheasant, Japanese quail

ES-D1

Heath, Robert G., James W. Spann, Elwood F. Hill, and James F. Kreitzer, 1972. Comparative dietary toxicities of pesticides to birds. USDI, F&WS Special Scientific Report - Wildlife No. 152. 57p. Submitted by Chevron Chemical Company; Reg. #239-1281 and 239-1721; Acc #232595, 12/19/77.

RESULTS: Eight-day dietary LC50 (with 95% c.i.) were found to be:
Bobwhite quail: 2117 ppm (1502-2890 ppm)
Ring-necked pheasant: 2538 ppm (2221-2896 ppm)
Japanese quail: 1327 ppm (1178-1490 ppm)
Toxic symptoms were not reported.

VALIDATION CATEGORY: Core for Bobwhite quail and Ring-necked pheasant.
Supplemental for Japanese quail.

CATEGORY RATIONALE: Classified according to R. Felthousen memo of March 22, 1978.

ABSTRACT: See cited reference for details of procedures.
Bobwhite quail were 10 days old; ring-necked pheasants were 8 days old; Japanese quail were 20 days old. Eight bobwhites were tested at each of 6 concentrations; 10 pheasants were tested at each of 5 concentrations; 20 Japanese quail were tested at each of 5 concentrations.

Technical

CHEMICAL NAME

Naled

(Dibrom)

Larry Turner

June 2, 1978

Avian dietary LC50
Mallard duck

ES-#1

REFERENCE: Heath, Robert G., James W. Spann, Elwood F. Hill, and James F. Kreitzer, 1972. Comparative dietary toxicities of pesticides to birds. USDI, F&WS Special Scientific Report - Wildlife No. 152. 57p. Submitted by Chevron Chemical Company; Reg. #239-1281 and 239-1721; Acc #232595, 12/19/77.

RESULTS: Mallard duck 8-day dietary LC50 = 2724 ppm (95% c.i.:1068-15089 ppm). Toxic symptoms and raw data were not reported.

VALIDATION CATEGORY: Core.

CATEGORY RATIONALE: Classified according to R. Felthousen memo of March 22, 1978.

ABSTRACT: See cited reference for complete procedures. Birds were 10 days old. Ten birds were tested at each of 5 concentrations.

• PLANT: Dibrom 14

CHEMICAL: Naled

85%

Naled

Larry Turner

June 2, 1978

Field study

Various non-target organisms
occurring in salt marshes

ES-BB1

REFERENCE: Lesser, Cyrus R. 1977. The effect of Naled on selected species of salt marsh organisms. 7 p. Study conducted by the Maryland Department of Agriculture. Submitted by Chevron Chemical Company; Reg. #239-1281 and 239-1721; Acc #232296, 11/21/77.

RESULTS: Mortality to non-target organisms following a single application of Dibrom 14 to a salt marsh habitat is given in the table below along with mortality in an untreated control plot. Mortality is given in percent for 48 hours following treatment.

Organism	#exposed		%Mortality	
	treated	control	treated area	control area
Eastern oyster (<u>Crassostrea virginica</u>)	95	100	0	0
hooked mussel (<u>Brachiodontes recurvus</u>)	24	27	4.2	3.7
salt marsh snail (<u>Melampus bidentatus</u>)	68	40	0	0
salt marsh periwinkle (<u>Littorina irrorata</u>)	49	46	0	0
red-jointed fiddler crab (<u>Uca minax</u>)	14	20	0	0
blue crab (<u>Callinectes spidus</u>)	6 ^(a) 2 ^(b)	6 ^(a) 2 ^(b)	50 ^(a) 0 ^(b)	33.3 ^(a) 0 ^(b)
grass shrimp (<u>Palaemonetes pugio</u>)	1 ^(c)	50	0	— ^(d)
spot (<u>Leiostomus xanthurus</u>)	25	21	0	9.5
salt marsh killfish (<u>Fundulus heteroclitus</u>)	7	0	0	—
Mallard (<u>Anas platyrhynchos</u>)	9	11	88.9	100

- (a) Crabs bought from a local "soft crab house" and undergoing molt.
- (b) "Hard crabs" obtained on the test site.
- (c) Originally 25 shrimp were caged, but 24 escaped from the holding cage.
- (d) All 50 caged shrimp died before treatment.

Investigator concluded that mortality due to Naled was negligible, and that total mortality was less than normal for field conditions. High mortality to blue crabs and mallards was not attributed to Naled because high mortality occurred also on the control plot. Mallard mortality was attributed to a severe thunderstorm the night after application; blue crab mortality was attributed to the general sensitivity of this species while moulting.

VALIDATION CATEGORY: Supplemental in general, but invalid with respect to conclusions about mallards, blue crab and grass shrimp.

CATEGORY RATIONALE: Mallard and blue crab portions were invalid due to very high control mortality. Grass shrimp portion was invalid because only one caged individual was exposed to treatment.

ABSTRACT: This field study was conducted on the Deal Island Wildlife Management Area in Somerset County, Md., in a tidal marsh and its adjacent upland. Dibrom 14 was applied undiluted to 650 acres at a rate of 1 fluid ounce (0.109 pounds a.i.) per acre. Application was made by aircraft in late morning at a temperature of 28°C and windspeed of 8 mph, and when tide was low at slack water. A control area of unspecified size was located about 2 miles south of the treatment area.

Ten non-target species (see "Results" section for specific identification) were obtained about 24 hours prior to application. Except for the soft crabs purchased locally and the mallards obtained from the Maryland Wildlife Administration, all organisms were collected near the test plot. Organisms were placed in holding cages by species which were then placed in appropriate habitats for each species. Mortality checks were made one hour before and 24 and 48 hours after application.

COMMENTS: This report appears to have been based on a hastily conceived and conducted study, although it does provide some supplemental information. Possibly this perception is due to incomplete reporting, such as:

1. Control site was undescribed in terms of habitat, size, and other treatment, if any.
2. Cages and species test sites were undescribed.

In addition control mortality of blue crabs and mallards, and the escape and loss of grass shrimp implies less than very good procedures.

In favor of the study, the following were noted:

1. Mortality for most organisms was low or zero.
2. Organisms tests appear to be a reasonable cross section of animals occurring there, with the exception that no annelids were tested.

In general this study appears to meet the classification criteria of supplemental. That is, it was not as good a project as we would like to see, but it is indicative to some extent of the probable impact on some non-target animals. The value of this study has been considered only in relation to the use of Dibrom 14 as a cuculicide in salt marshes at the tested rate. The value for other use patterns will have to be determined accordingly.